

Abstract Submitted
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Examining the Magnetic Properties of LaCoO_3 Thin Films Using Magnetic Force Microscopy¹ MORGANN BERG, AGHAM POSADAS, ALEX DE LOZANNE, ALEXANDER DEMKOV, Department of Physics, The University of Texas at Austin — In contrast to the non-magnetic ground state of bulk LaCoO_3 (LCO) at low temperatures, ferromagnetism has been observed in elastically strained thin film specimens. The origins of ferromagnetism in strained LCO thin films have been obscured by conflicting experimental results. Pulsed laser deposition (PLD) is the current standard of preparation techniques used to grow thin films of LCO, but results from thin film LCO samples prepared by PLD have been questioned on the basis of chemical inhomogeneity and film defects. Using magnetic force microscopy, we investigate the microscale magnetic properties of strained thin films of LCO prepared by molecular beam epitaxy and deposited on lanthanum aluminate and strontium titanate substrates. We observe these properties across a temperature range surrounding the Curie temperature ($T_c \sim 80\text{K}$) and compare our results to global magnetic characteristics of these films as measured by a SQUID magnetometer.

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